New Hampshire DOT

RESEARCH HIGHLIGHTS

Spring 2003

Implementing Successful Research

In October 2000, Corrosion Control Consultants and Labs, Inc. of Kentwood, MI, completed a NHDOT research study titled "Alternate Paint Systems for Overcoating". The study included a number of recommendations related to surface preparation, painting and maintenance of existing coating systems for steel bridge members. These recommendations were readily adaptable to the assessment and design processes associated with the Department's contracted bridge maintenance coating program; however, improvements to existing practices employed by the Bureau of Bridge Maintenance were constrained by a lack of proper training, equipment and funding.

In early 2003, research implementation funds enabled the Bureau of Bridge Maintenance to enhance its bridge steel overcoating capabilities through a program of worker training; acquisition of equipment for assessment, surface preparation and application of coating systems; and materials for a small number of test bridges. Ongoing efforts will be aimed at further evaluation and improvements to the program.

Durability of Truncated Domes

Through the cooperative efforts of several Department Bureaus, this fast-track project was completed during the 2002-03 winter season. Eight truncated dome systems of varying materials and installation methods were installed on fabricated sidewalk panels, which were assembled in January 2002 to create a 229-foot test section. The test section included ramps constructed of anti-freeze concrete currently being evaluated by CRREL. The first winter "season" consisted of 20 plow cycles. The evaluation report was distributed in April 2003.

Evaluation of Fixed End Bridge Joints

The problem of pavement cracking at the fixed end of bridges has plagued the Department for many years. Pavement cracking appears at the fixed end soon after final paving or resurfacing. Treatment options were evaluated with the goal of implementing a system to control and seal the cracks before they became a maintenance issue.

The project involved locating the fixed end joint of four bridges, creating a sealant reservoir over the joints through the wearing course of the pavement by means of saw cutting, and sealing the reservoir. Each reservoir was sealed with one of four products that are designed to seal pavement cracks. The work was executed by Nicom, Inc. of Barre, VT over the period of October 18 through October 24, 2002.

All of the joints will be monitored for a period of at least two years. At the end of the evaluation period, a determination will be made if any of these products offer a cost effective solution to the problem of pavement cracking at the fixed end joint of bridges.

Prolonging Service Life of Weathering Steel (ASTM A 588) Guardrail

Thought to be more *environmentally blending* in appearance, A 588 guardrail has been installed on National Forest land dating back to the early 70's. However, scenes like the one shown prompted an investigation of the condition of the A 588 guardrail throughout the State. The 1997 report recommended replacement of A 588 with galvanized rail at the end of its functional life.

The Department also investigated ways to make the A 588 last longer. Guardrail sections were treated with various corrosion inhibiting and water proofing products and assembled to simulate lap connections. The samples were conditioned for 5000 hours in a 5% salt fog, and evaluated for overall condition. The most effective treatment was a piece of pure zinc foil shaped to fit between the sections that virtually stopped corrosion from occurring in between the sections. In 2002, language was added to the Standard Specifications requiring the use of zinc inserts at all lap locations. However, the use of zinc can be expected to add 25% or more to the cost of guardrail installations. Because of safety and financial considerations, the Department, with backing from the USFS, will be replacing A 588 with galvanized guardrail, pending further developments in weathering steel technology.

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SAMPLING OF ACTIVE PROJECTS

Application of the Bailey Method to NH asphalt Mixtures

Bridge Deck Condition Surveys- Synthesis, Evaluation, Recommendations

Evaluation of Automated Bridge Anti-Icing System

Improved Communication w/ Multiple Transportation Providers for Elderly/Disabled Ride

Alternate Uses of Wireless Networking Technology

NEW RESEARCH REPORTS from NHDOT

Use of Ground Penetrating Radar to Delineate Bridge Deck Repair Areas

Enhancing Geotechnical Information with Ground Penetrating Radar

New Hampshire's Concrete Aggregate and Alkali-Silica Reactivity

GIS and the New Hampshire Rock Cut Management System

Durability of Truncated Dome Systems (a.k.a. Detectable Warning Surfaces)

Biological Control of Purple Loosestrife in New Hampshire

NEW RESEARCH SELECTED by 2003 NHDOT RAC

Condition Assessment and Evaluation of Rock Reinforcement Along Barron Mountain Rockcut, I-93, Woodstock

Evaluation of Alternative Deicing Chemicals vs. Conventional Sodium Chloride

Investigation of NH's Live Load Deflection Criteria as Related to Economy, User Comfort, and Durability of the State's Bridges

Structural Number of Crushed Gravel, Stone Base Course and Reclaimed Stabilized Base during Freeze Thaw Cycles

Performance Curves for Treatments used in Pavement Management Model

Assessment of Existing Pavement Management Triggers and Trigger Strategies (contingent on available funds)

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